# Remarks

The undersigned's Remarks are preceded by related comments of the Examiner, presented in small bold-faced type.

> **2. Claims 1-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over LeClair et al, US patent no. 5,485,390.**
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> **As per claim 1, LeClair discloses a computer aided design method and a CAD system for construction of a model with feature limitations very similar to the claimed invention (Summary of the Invention). According to LeClair, the CAD modeling method includes:**

The Examiner's rejection is respectfully traversed. Contrary to the Examiners suggestion, what is disclosed and claimed in the present application is distinctly different from what is disclosed by LeClair and LeClair simply does not suggest the invention disclosed and claimed in the present application.

The present invention is directed to the automatic coupling of a feature and a part. Generally speaking, what this "automatic coupling" provides is a matching or pairing between features and parts. For example, a "feature" may be a hole passing through components of a model and, based on characteristics of that "feature" (e.g., the diameter and depth of the hole), the present invention would automatically identify a compatible "part" (e.g., a fastening pin with the proper length and diameter to pass through the hole). By applying the automatic coupling of the present invention, a CAD system can determine that a feature and one or more parts are compatible with one another and, thus, can be used to assist in the development of a model during a model design process. (See also, e.g., pages 3-4 of the present application).

In contrast to the model design oriented process of the present application, LeClair discloses a process that, as currently understood by the undersigned, is not applied to design a model, but rather, is applied to prepare a model for manufacturing. What LeClair describes is a computer-aided design system for designing a process for machining one part. To machine this part, a machining process is determined that removes material from a piece of stock (i.e., the raw material from which a part is manufactured). Analogous to the stock, the Feature Based Design Environment (FBDE) described in LeClair uses a volume of material referred to as the "Starting Feature" to begin a part design (col. 8, lines 51-61).

LeClair addresses how to arrive at a sequence of removing material (Col 6, lines 52-56). Features, as described in LeClair, are used by designers and machinists to "associate and reason about the part and interaction between the machine tool, fixture and starting raw stock. . . ." To design a machine process, LeClair teaches that a machinist can rely on his experience (Col 6, line 66 through Col 7, line 1) and can refer to a previously defined machine process used on a similar part by retrieving parts and their associative processes from memory (Col 7, lines 36-39 and Col

8, lines 4-11). Le Clair does not discuss that upon retrieving parts from memory the parts are coupled to a feature. LeClair does not teach identifying, selecting, or retrieving a part that compatibly couples with a feature belonging to another object.

The present invention is quite different than what is disclosed in LeClair. The present invention is directed to modeling features of three-dimensional objects and determining compatible couplings between those features and various parts. LeClair does not teach automatically identifying a part comprising a part model of another three-dimensional object configured to compatibly couple with the feature. The present invention teaches locating parts that compatibly couple with features of a three-dimensional object (e.g., locating a bolt having a compatible length and diameter to a hole feature); whereas, LeClair teaches providing a machinist or process designer with "associative retrieval of past similar process designs" (Col 7, lines 36-39), for example, retrieval of past process designs for parts with similar overall dimensions, surface area, etc. (Col 8, lines 13-18), as the part for which a machine process is currently being designed.

The post-design manufacturing-oriented machining process disclosed by LeClair simply does not suggest, nor indicate a reason to apply, the present application's process for feature-to-part matching to aid in the design of a model.

It is noted that LeClair does discuss "coupling" and "design" (see, e.g., LeClair at col. 7, lines 12-15), however, this "coupling" and "design" is not what is disclosed and claimed in the present invention. The undersigned understands LeClair's coupling at col. 7, lines 12-15 to be a reference to a matching of the machining processes to the part being manufactured and the undersigned understands that the reference to "design" at col. 7, lines 12-15 is not the "design" of a model (as the present invention is directed to), but rather the "design", or setting forth, of the machining steps to manufacture a part that has already been modeled.

Because LeClair does not teach or suggest the automated coupling invention recited in the claims of the present application, the Examiner's rejection under § 103 is not supported.

> **Constructing feature of a three-dimensional model of a real world object based on data input by a user (col. 5, lines 15-25, col. 6, lines 51-65, for example), and**
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> **Automatically identifying a part comprising a part model of another three dimension part configured to compatibly couple with the feature, and the part being identified based on design attributes of the feature as claimed (Figs. 2, 3, col. 7, line 15 to col. 8, line 60). LeClair does not expressly disclose the claimed feature of three-dimensional object model for the identified part.**
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> **Practitioner in the art at the time of the invention was made would have found LeClair CAD design and modeling for part assembly configured for compatible feature coupling above would require and imply the three-dimensional object model of the coupled part for feature connection and for compatibly coupling object components for part produce and assembly in the three dimensional environment.**

Contrary to the Examiner's suggestion, Figs. 2, 3, col. 7, line 15 to col. 8, lines 60 do not teach or suggest automatically identifying a part ... configured to compatibly couple with the feature, and the part being identified based on design attributes of the feature as claimed. As explained above, LeClair simply does not disclose the identification of compatible parts and features. It appears that the sections of LeClair cited by the Examiner is directed merely to the determination of machining steps, rather than the determination of feature-part coupling. For this additional reason, the Examiner's rejection under § 103 is not supported.

Furthermore, it is respectfully submitted that the Examiner's conclusion that practitioner's would have found LeClair's CAD design and modeling for part assembly configured for compatible feature coupling above would require and imply the three-dimensional object model of the coupled part for feature connection and for compatibly coupling object components for part produce and assembly in the three dimensional environment appears to be based on nothing more than hindsight reasoning gained by the Examiner from a reading of the present application. The application of such hindsight reasoning is forbidden. See MPEP § 2142 ("impermissible hindsight must be avoided"). Furthermore, the Examiner has provided no objective evidence whatsoever of the knowledge or skill of practitioner's in the field at the time of invention nor has the Examiner provided any objective evidence of practitioners skill with regard to the automatic determination of compatible couplings between parts and features. The Examiner's rejection of claim 1 under § 103 is also improper for the foregoing reasons.

The undersigned has set forth several separate and independent reasons why the Examiner's rejection under § 103 is not supported. In light of the foregoing, it is respectfully requested that the Examiner withdraw his rejection and allow the claims.

Claims 2-6 depend, directly or indirectly, on claim 1 and are patentable for at least the reasons set forth with respect to claim 1.

> **As per claim 7, LeClair discloses a computer aided design method and a CAD system for construction of a model with feature limitations very similar to the claimed invention (Summary of the Invention). According to LeClair, the CAD modeling method includes:**
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> * * *
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> **As per claim 12, LeClair discloses a computer aided design method and a CAD system for construction of a model with feature limitations very similar to the claimed invention (Summary of the Invention). According to LeClair, the CAD modeling method includes:**
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> **As per claim 23, LeClair discloses a computer aided design method and a CAD system for construction of a model with feature limitations very similar to the claimed invention (Summary of the Invention). According to LeClair, the CAD modeling method includes:**
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> * * *

> **As per claim 25, LeClair discloses a method and system for designing and modeling objects in computer aided system with feature limitation identical to the claimed invention (Summary of the Invention). According to LeClair, the CAD modeling method includes:**

The Examiner's rejections of independent claims 7, 12, 23 and 25 are substantially identical to the Examiner's rejection of claim 1. It is respectfully submitted that the Examiner's rejection of claim 7, 12, 23 and 25 are not supported for the reasons set forth with respect to claim 1. It is respectfully requested that the Examiner withdraw his rejection and allow the claims.

Claims 8-11, 13-22, 24 and 26-29 depend, directly or indirectly, on claims 7, 12, 23 or 25 and are allowable for at least the reasons set forth with regard to their respective independent claim.

## Conclusions

Claims 1-29 are now pending and believed to be in condition for allowance. Applicants respectfully request that all pending claims be allowed.

Please apply any credits or excess charges to our deposit account number 50-0521.

Respectfully submitted,

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James V. Mahon
Reg. No. 41,966

Clifford Chance US LLP
31 West 52nd Street
New York, NY 10019-6131
Telephone: (212) 878-8073